

EXTRA PRACTICE 33
Applications with Motion
Use after Section 8.5

Name _____

Example: A car leaves town going south at 50 mph. One hour later another car leaves on the same road traveling at 60 mph. How far from town will the second car overtake the first?

	Distance	Speed	Time
Slow car	d	50	$t + 1$
Fast car	d	60	t

Solving the system of equations

$$d = 50(t + 1),$$

$$d = 60t$$

$$50(t + 1) = 60t$$

$$50t + 50 = 60t$$

$$t = 5$$

Since we are asked for distance,

$$d = 60t \text{ or } d = 60(5) = 300 \text{ miles.}$$

Solve.

1. A train leaves town traveling north at 40 km/h. Two hours later another train leaves on a parallel track and travels north at 45 km/h. How far from town will the second train overtake the first? _____
2. Two cars leave town at the same time going in opposite directions. One travels at 50 mph, and the other travels at 60 mph. In how many hours will they be 495 miles apart?

3. A boat traveled for two hours downstream with a 5 km/h current. The return trip against the same current took four hours. Find the speed of the boat in still water. _____
4. An airplane flew for three hours with a 30-mph tail wind. The return flight against the same wind took $3\frac{1}{2}$ hours. Find the speed of the airplane in still air. _____
5. A canoeist paddled two hours with a 3 km/h current to a fishing site. The return trip against the same current took six hours. Find the speed of the canoe in still water. _____
6. A train leaves Smithville and travels south at a speed of 60 mph. Three hours later, a second train leaves on a parallel track and travels south at 90 mph. How far from the _____ station will they meet? _____
7. A small boat took 2 hr to make a trip downstream with a 4-mph current. The return trip against the same current took 3 hr. Find the speed of the boat in still water. _____